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Distribution of soil organic carbon impacted by land-use change and check dam on the Loess Plateau of China

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Vegetation restoration, terrace and check dam construction are the major measures for soil and water conservation on the Loess Plateau. These effective measures of stabilizing soils have significant impacts on soil organic carbon (SOC) distribution. To understand the impact of land-use changes combined with check dam construction on SOC distribution, 1060 soil samples were collected across a watershed on the Loess Plateau. Forestland, shrubland and terrace had significant higher SOC concentrations in the 0-20 cm soil layer than that of sloping cropland. Land use change affects the process of runoff and sediment transportation, which has an impact on the migration and transformation of soil carbon. The soil erosion of sloping farmland is the most serious, and the maximum annual erosion rate is as high as 10853.56 t·km⁻². Carbon sedimented in the dam land was mainly from sloping cropland, and this source percentage was 65%. The application of hydrological controls to hillslopes and along river channels should be considered when assessing carbon sequestration within the soil erosion subsystem.